



# Portable Vapor-Compression Cooling System (PVCS)

## Overview:

The **Portable Vapor-Compression Cooling System (PVCS)** is a self-contained man-portable microclimate cooling system designed to provide wearers of insulative protective clothing with cooling to reduce the effects of heat stress.

## Description:

The PVCS consists of the Refrigeration Unit, Battery Module, Heat Transfer Garment, and accessory tether lines. The Refrigeration Unit chills the coolant and pumps it through the External Coolant Tether Line and into the Heat Transfer Garment. Metabolic heat from the body is transferred to the coolant as it flows through the network of tubing in the Heat Transfer Garment. The coolant then flows back to the Refrigeration Unit where the heat is rejected. The Battery Module can be disconnected and detached from the Refrigeration Unit if a DC power supply is available.

## Specifications:

- Cooling capacity (Battery Mode): 1200 watt-hours (300 watts cooling rate)
- Comfortable coolant temperature delivered at 65°-70°F
- Four-hour duration on batteries, indefinitely on 24-28 volt vehicle power
- Compact size (Refrigeration Unit 10.125" x 6.625" x 6.25", Battery Module 10.25" x 6.875" x 6.25)
- Full body cooling through liquid cooling shirt, pants, & hood
- Energy efficient (6 amps max. at 24 volts)
- Refrigeration Unit Type: Vapor Compression (HFC, R-134a refrigerant)
- Battery Module: Four BA5590 lithium sulfur dioxide batteries
- Refrigeration Unit Weight: 10 lbs.
- Battery Module Weight: 11 lbs.
- Heat Transfer Garment (Shirt, pants, and hood) Weight: 6 lbs.

## Status:

The PVCS has been favorably evaluated in heat stress induced physiological studies in climatically controlled chambers. Currently, the PVCS is being adapted for use on rotary wing aircraft.

## Point of Contact:

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